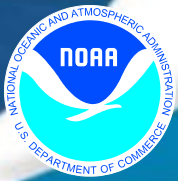


# Advanced Hydrologic Prediction Service (AHPS)

Water Predictions  
for  
Life Decisions

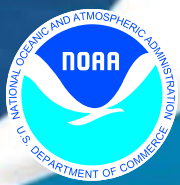


# Advanced Hydrologic Prediction Service



## Presentation Outline

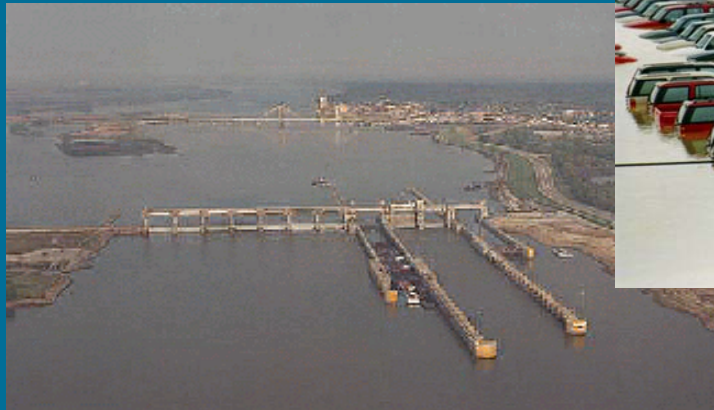
- Define AHPS
- Show What AHPS Provides
- Introduce Program Teams & Partners
- Review Project Areas
- Present Funding Status

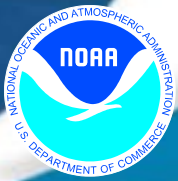


# Advanced Hydrologic Prediction Service



**AHPS is about enhanced flood warnings and water resource forecasts leveraging NOAA's infrastructure and expertise.**



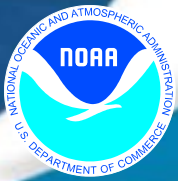


# Advanced Hydrologic Prediction Service



## Presentation Outline

- Define AHPS
- Show What AHPS Provides
- Introduce Program Teams & Partners
- Review Project Areas
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# Advanced Hydrologic Prediction Service

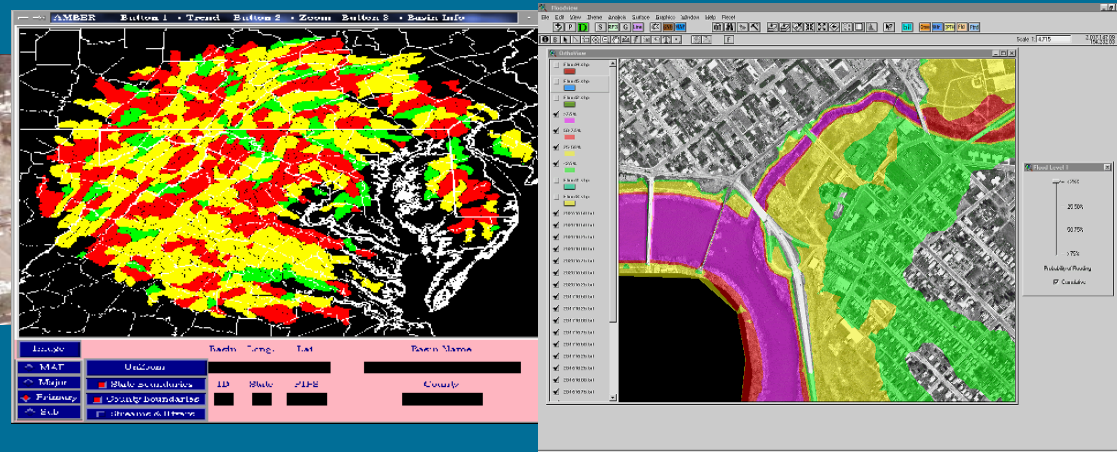


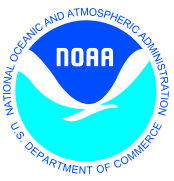
## Unmet Customer Needs

- More precise forecasts over all time scales
- Information to make risk based decisions
- Universal access
- Visually oriented products

## AHPS Provides

- Flash-flood to seasonal forecasts
- Forecast certainty
- Improved product delivery (Internet, wireless)
- Inundation forecasts





# The Public Image:

## AHPS

### Web Access

### Demonstration





National Oceanic and Atmospheric Administration

# National Weather Service

WORKING TOGETHER TO SAVE LIVES



Site Map
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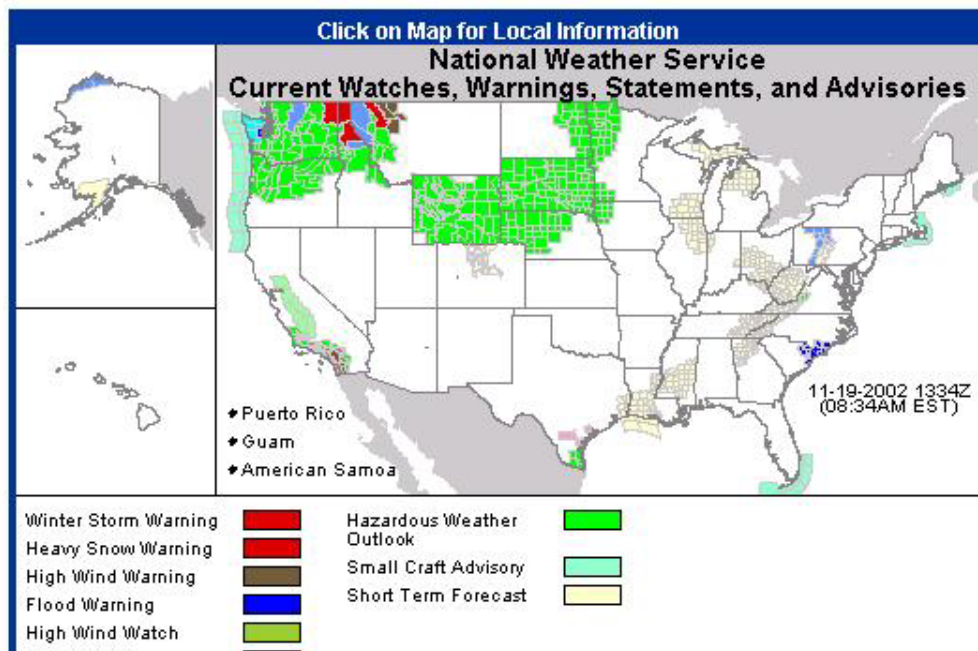
Local forecast by "City, St"

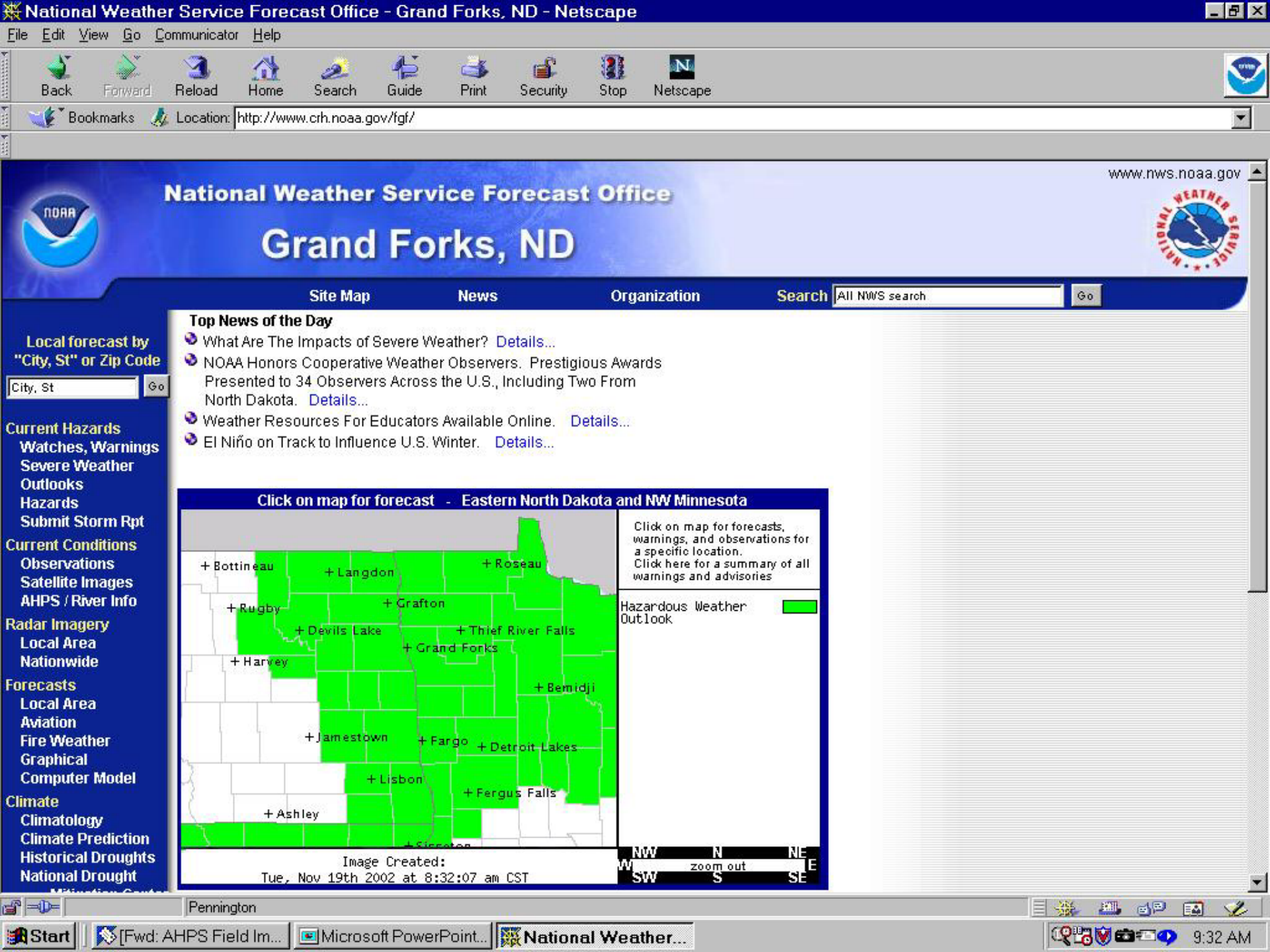


- Warnings
- Current...
- Observations
- Radar
- Satellite
- Snow Cover
- Surface Weather...
- Forecasts
- Local
- Aviation
- Marine
- Hurricanes
- Climate...
- Forecast Maps/Models
- Weather Safety
- Weather Radio
- Education
- Information Center
- Past Weather
- Glossary
- Publications...
- Careers
- Contact Us

## World's Largest Archive of Climate Data At Your Fingertips

All weather and climate data gathered by the National Weather Service, military services, the Federal Aviation Administration, and the Coast Guard is archived at NOAA's [National Climatic Data Center \(NCDC\)](#). The NCDC compiles the weather data (temperatures, precipitation totals, heating and cooling degree days, and more) collected from thousands of sites in the U.S. [Details...](#)





Current Hazards  
Watches, Warnings  
Severe Weather  
Outlooks  
Hazards  
Submit Storm Rpt

Current Conditions  
Observations  
Satellite Images  
AHPS / River Info

Radar Imagery  
Local Area  
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Forecasts  
Local Area  
Aviation  
Fire Weather  
Graphical  
Computer Model

Climate  
Climatology  
Climate Prediction  
Historical Droughts  
National Drought  
Mitigation Center

Weather Safety  
Storm Ready  
Preparedness  
Weather Radio  
EMWIN

Miscellaneous  
Cooperative Pgm  
Cnty Warning Area  
Science  
Weather Calculator  
Weather Terms

**Map Legend**

- or ■ above Flood Stage  
● or ■ near Flood Stage  
● or ■ below Flood Stage

- A square indicates that hydrograph information is available  
● A circle indicates that both probability and hydrograph information are available

Click on a point or river on the map  
or select from the menus below.

- Red River --  
-- Devils Lake --  
-- Wild Rice River (ND) --  
-- Sheyenne River --  
-- Maple River --  
-- Goose River --  
-- South Buffalo River --  
-- Buffalo River --  
-- Wild Rice River --  
-- Marsh River --  
-- Sandhill River --  
-- Red Lake River --  
-- Forest River --  
-- Snake River --  
-- Park River --  
-- Two Rivers River --  
-- Pembina River --  
-- Roseau River --

Local forecast by  
"City, St" or Zip Code

 City, St 

Current Hazards  
Watches, Warnings  
Severe Weather  
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Storm Ready  
Preparedness  
Weather Radio  
EMWIN

Miscellaneous  
Cooperative Pgm

## Red River at Fargo Flood Stage: 17 Feet

Latest Stage: 14.3 Feet at 12:00 GMT 11/19

[\[Graph Description\]](#) [\[Feedback\]](#) [\[Text Products\]](#) [\[Precip.\]](#)  
[\[Impacts\]](#) [\[Map\]](#) [\[Historical Crests\]](#) [\[Low Water Events\]](#)

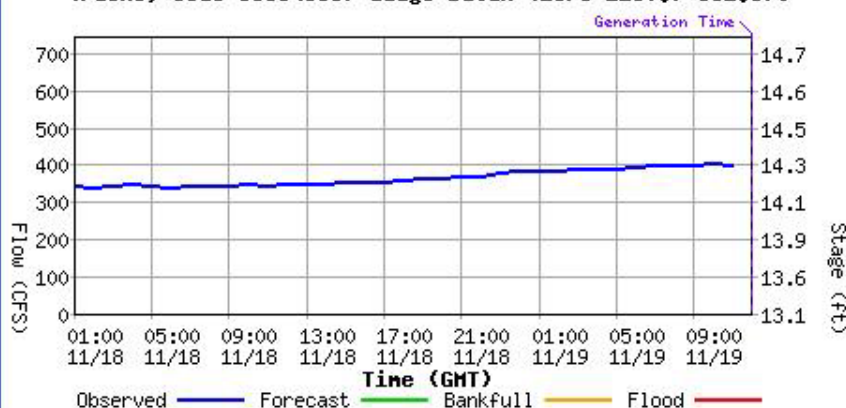
# AHPS

Advanced  
Hydrologic  
Prediction  
Service

[Click Here for  
Red River  
at a Glance](#)



## RED RIVER AT FARGO (FGON8, USGS 05054000) Gauge Datum (Zero Elev.) 861.8ft



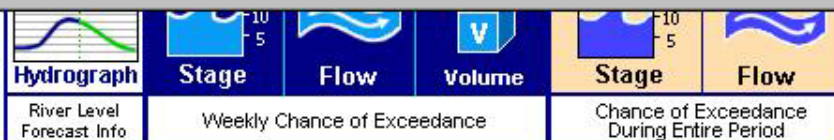
Latest: 14.3 ft 409 CFS [12:00 11/19]  
Max: 14.3ft (409 CFS) Max Fcst: NONE  
Min: 14.2ft (340 CFS) Min Fcst: NONE

\* \* \* Stages may be ice affected \* \* \*  
Extreme cold weather may cause invalid stage data  
Subtract 5 hrs for CDT, 6 hrs for CST

Tabular  
Data

- Red River --
- Devils Lake --
- Wild Rice River (ND) --
- Sheyenne River --
- Maple River --
- Goose River --
- South Buffalo River --
- Buffalo River --
- Wild Rice River --
- Marsh River --
- Sandhill River --
- Red Lake River --
- Forest River --
- Snake River --
- Park River --
- Two Rivers River --
- Pembina River --
- Roseau River --

Outlooks  
Hazards  
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Miscellaneous  
Cooperative Pgm  
Cnty Warning Area  
Science  
Weather Calculator  
Weather Terms  
Diversity  
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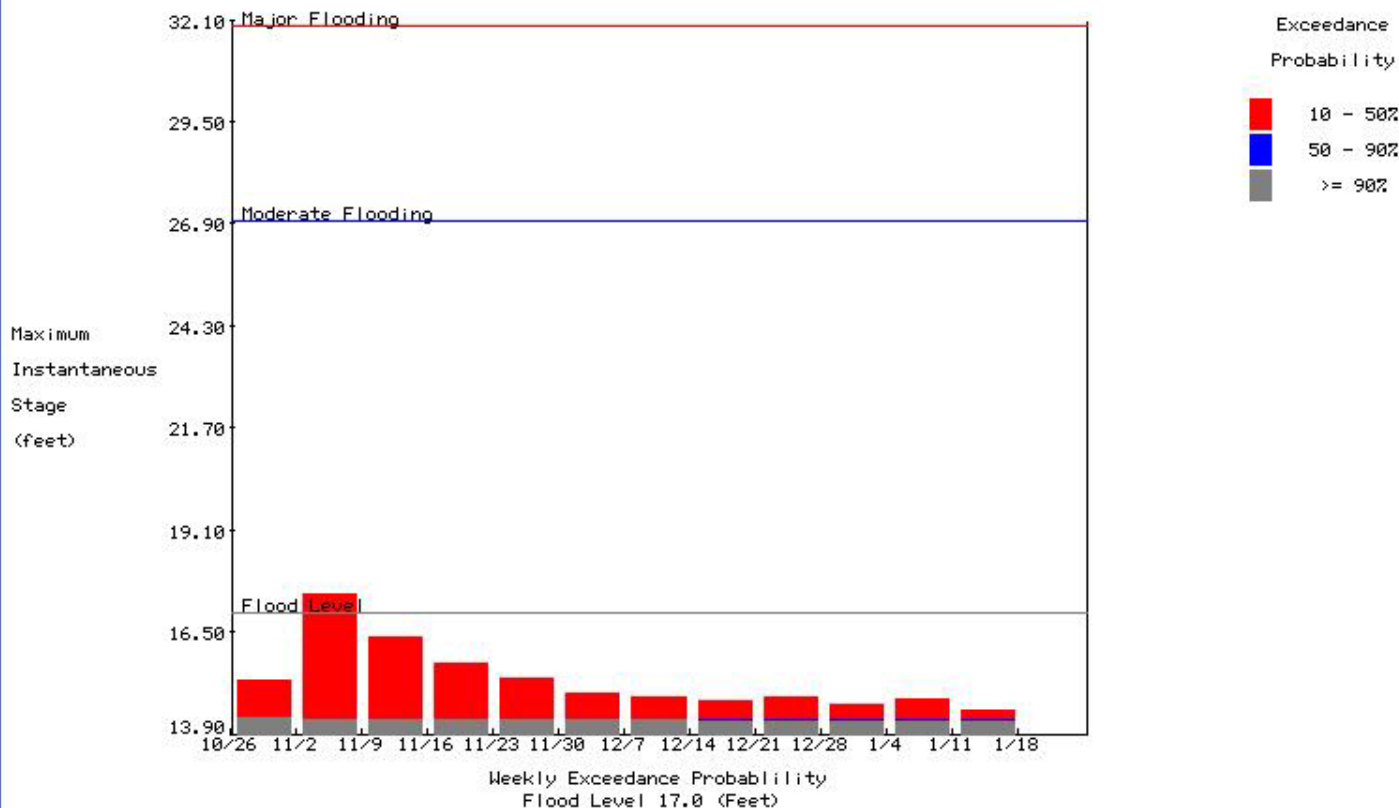


1 Week Chances of Exceeding River Levels on the RED R at FARGO ND

Latitude: 46.5 Longitude: 96.7

Forecast for the period 10/26/2002 - 1/18/2003

This is a conditional simulation based on the current conditions as of 10/21/2002



-- Devils L  
-- Wild Ric  
-- Sheyenn  
-- Maple R  
-- Goose F  
-- South Bu  
-- Buffalo F  
-- Wild Ric  
-- Marsh R  
-- Sandhill  
-- Red Lak  
-- Forest R  
-- Snake R  
-- Park Riv  
-- Two Riv  
-- Pembina  
-- Roseau

**Hazards**  
Submit Storm Rpt

**Current Conditions**  
Observations  
Satellite Images  
AHPS / River Info

**Radar Imagery**  
Local Area  
Nationwide

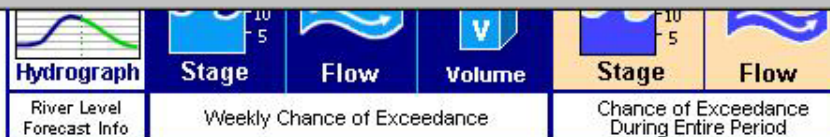
**Forecasts**  
Local Area  
Aviation  
Fire Weather  
Graphical  
Computer Model

**Climate**  
Climatology  
Climate Prediction  
Historical Droughts  
National Drought  
Mitigation Center

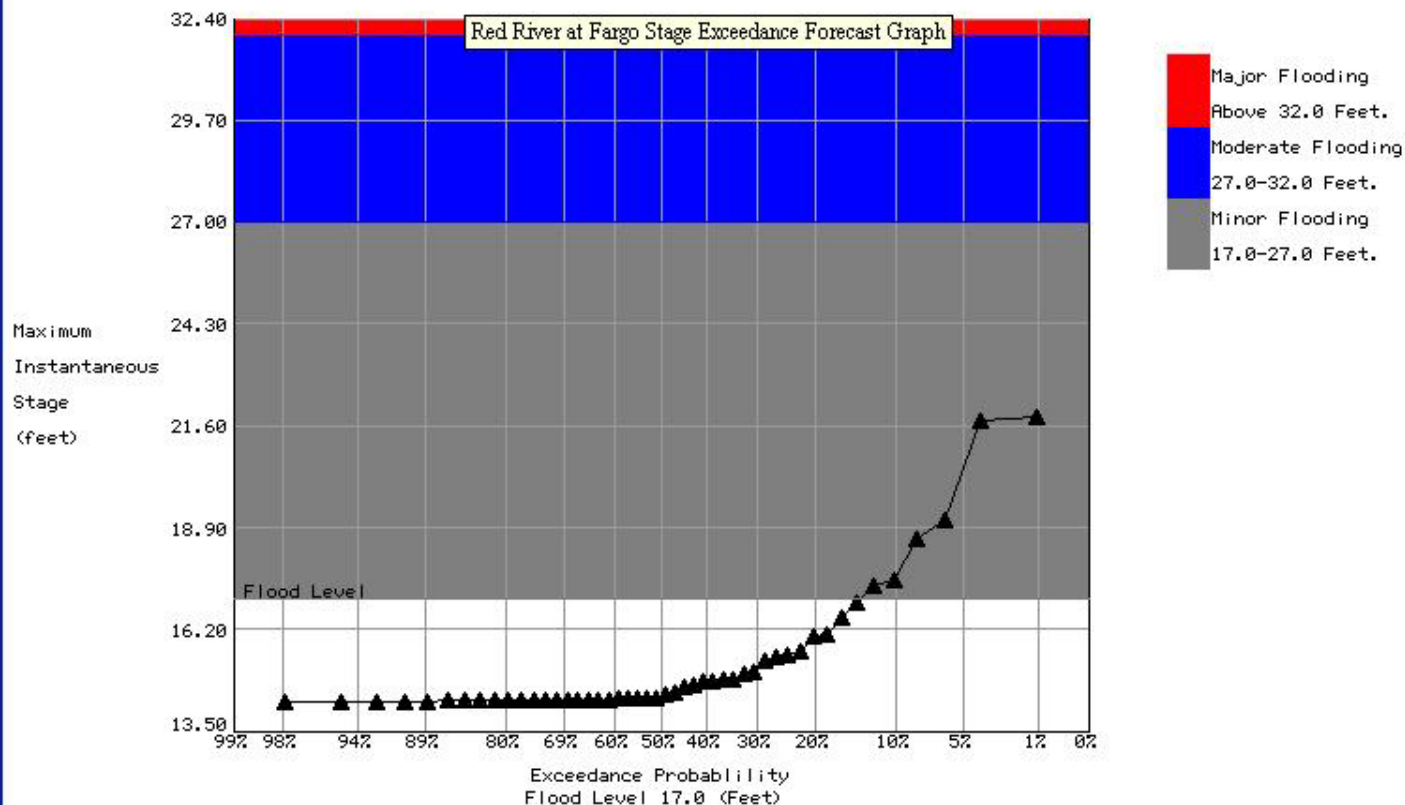
**Weather Safety**  
Storm Ready  
Preparedness  
Weather Radio  
EMWIN

**Miscellaneous**  
Cooperative Pgm  
Cnty Warning Area  
Science  
Weather Calculator  
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Chances of Exceeding River Levels on the RED R at FARGO ND  
Latitude: 46.5 Longitude: 96.7  
Forecast for the period 10/26/2002 - 1/19/2003  
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-- Devils L  
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-- Sandhill  
-- Red Lak  
-- Forest R  
-- Snake R  
-- Park Riv  
-- Two Riv  
-- Pembina  
-- Roseau

The term **Minor Flooding** is used to indicate minimal or no property damage. However, some public inconvenience is possible.

The term **Moderate Flooding** is used to indicate the inundation of secondary roads. Transfer to higher elevation may be necessary to save property. Some evacuation may be required.

The term **Major Flooding** is used to indicate extensive inundation and property damage, usually characterized by the evacuation of people and livestock, and the closure of both primary and secondary roads.

[Past Precipitation](#)

[Forecast Precipitation](#)

#### Information

##### Top 10 Historical Crests

- (1) 39.72 ft on 04/18/1997
- (2) 37.34 ft on 04/17/1997
- (2) 37.34 ft on 04/15/1969
- (4) 36.69 ft on 04/14/2001
- (4) 36.69 ft on 04/08/2001
- (6) 35.34 ft on 04/09/1989
- (7) 34.93 ft on 04/19/1979
- (8) 34.41 ft on 04/02/1978
- (9) 33.26 ft on 07/04/1975
- (10) 30.5 ft on 04/15/1965

[More Past Crest and Flow Information](#)

##### Top 5 Low Water Events

- (1) 0.0 ft on 10/10/1976
- (2) 0.0 ft on 10/01/1970
- (3) 0.0 ft on 09/30/1970
- (4) 0.0 ft on 01/01/1932
- (5) 5.3 ft on 12/02/1910



**Impacts**

40.0 Feet	TOP OF ISLAND PARK DIKE.
39.8 Feet	TOP OF VA CENTER DIKE.
39.1 Feet	500 YEAR FLOOD (0.02% CHANCE).
38.2 Feet	INTERMEDIATE REGIONAL FLOOD LEVEL (FEMA - 100 YR FLOOD).
37.0 Feet	EARTH ADDED TO DIKE BTWN 10TH AV SOUTH IF RIVER IS FCST TO RISE ABOVE 37'.
35.0 Feet	DIKE ALLEY ENTRANCE TO ELM CIRCLE.
34.0 Feet	SANDBAG DIKE NEAR 15TH AV AND ELM ST NORTH IF RIVER IS FCST TO RISE ABOVE 36.5'.
33.0 Feet	BUILD DIKE SOUTH OF LIFT STATION NEAR 2ND ST AND MAIN AV.
32.5 Feet	BRIDGE AT 1ST AV AND 2ND ST NORTH CLOSES FOR CONSTRUCTION OF TEMP DIKE ON 2ND ST.
1ST AV N BRIDGE Feet	ACROSS RED RIVER CLOSES FOR CONSTRUCTION OF TEMP DIKE ACROSS 1ST AV NORTH.
30.0 Feet	2ND ST CLOSED BTWN MAIN AV AND 4TH ST. BUILD TEMP DIKE TO PORTECT AREA WWIN OAK ST DIKE; 58' SOUTH OF 9TH AV NORTH.
28.6 Feet	RIVER TOPS DIKE AT EL ZAGEL GOLF COURSE - WEST OF ELM ST.
28.0 Feet	BEGIN CONSTRUCTION OF DIKE TO PROTECT SEWAGE TREATMENT PLANT IF RIVER FCST TO GO ABOVE 34'.
25.0 Feet	CITY PARKS AND REC AREAS NEAR RIVER FLOOD.
24.0 Feet	2ND ST CLOSES BTWN 1ST AND 3RD AV NORTH FOR CONSTRUCTION OF TEMP EARTH DIKE (PROTECTS CITY HALL).
23.3 Feet	NORTH BROADWAY BRIDGE FLOODS.
20.6 Feet	NORTH BROADWAY BRIDGE CLOSES
19.4 Feet	ELM STREET FLOODS.
18.0 Feet	NORTH LANE OF ELM STREET BETWEEN 14TH AND 15TH AV IS CLOSED.

**Other Data Sources**



# National Weather Service Advanced Hydrologic Prediction Service


[Site Map](#) [News](#) [Organization](#)

(Download [Acrobat Reader](#) if you cannot see the .pdf file on the right. Adjust zoom level to 100% for optimal viewing.)

**FLDIMS** is the internet mapserver component of the NWS flood forecast mapping application, FLDVIEW. FLDVIEW is a GIS application developed to show the extent of flooding. Given an appropriate Digital Elevation Model (DEM), a water surface profile, and river centerline, FLDVIEW will generate a flood forecast raster in shapefile format, which can be overlaid with other information (e.g., orthophoto images, tiger maps, etc.) FLDVIEW can generate either a deterministic

## FLDIMS

Today is

June 13, 2002

Forecast Period

May 29 to June 07

Flood Probability

	ON	OFF
10 %	<input checked="" type="radio"/>	<input type="radio"/>
25 %	<input type="radio"/>	<input checked="" type="radio"/>
80 %	<input type="radio"/>	<input checked="" type="radio"/>
90 %	<input type="radio"/>	<input checked="" type="radio"/>

Flood Forecast

	ON	OFF
peak	<input type="radio"/>	<input checked="" type="radio"/>

Layers

	ON	OFF
Rivers	<input type="radio"/>	<input checked="" type="radio"/>
Streams	<input type="radio"/>	<input checked="" type="radio"/>
Roads	<input checked="" type="radio"/>	<input type="radio"/>
Railways	<input checked="" type="radio"/>	<input type="radio"/>

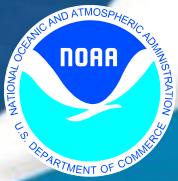


finalf1010 : Juniata - 10%

1 : 6,760

4,043 x 2,676 (ft)

Document: Done

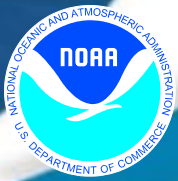


# Advanced Hydrologic Prediction Service



## Presentation Outline

- Define AHPS
- Show What AHPS Provides
- Introduce Program Teams & Partners
- Review Project Areas
- Present Funding Status

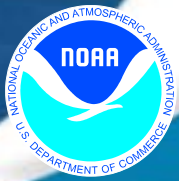


# National Weather Service



## AHPS Team

- Headquarters
- Office of Hydrologic Development
- Regions
  - River Forecast Centers
  - Weather Forecast Offices

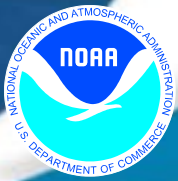


# Advanced Hydrologic Prediction Service



## Partners

- National Safety Council
- National Hydrologic Warning Council
- Federal Agencies
- River Basin Commissions
- Universities
- AHPS SETA Contractor

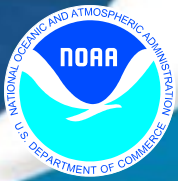


# Advanced Hydrologic Prediction Service



## Presentation Outline

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- Review Project Areas
- Present Funding Status



# AHPS Project Areas



- Field Implementation
- Science
- Software
- Data
- Outreach/Training



# Project Enabled Services



## Basic

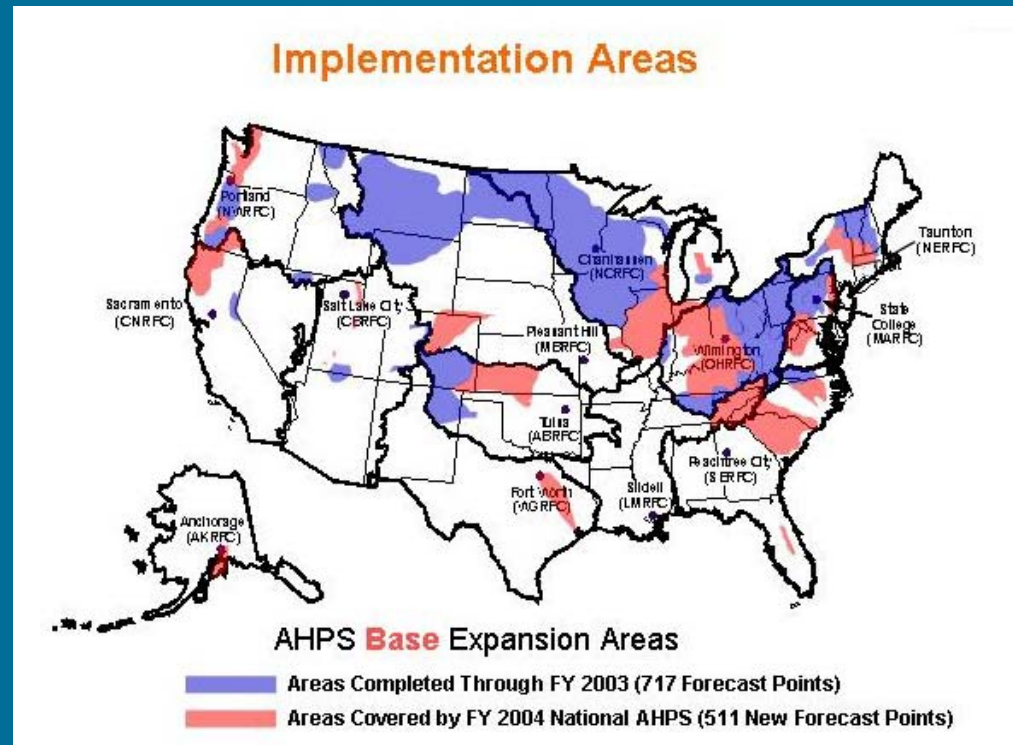
- Enhanced river level or water supply forecasts
- Long-term probability information

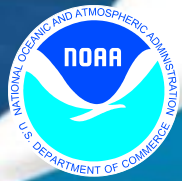
## Full

- Flash-flood forecast tools
- Short- and medium-term probability information
- Low flow and drought products

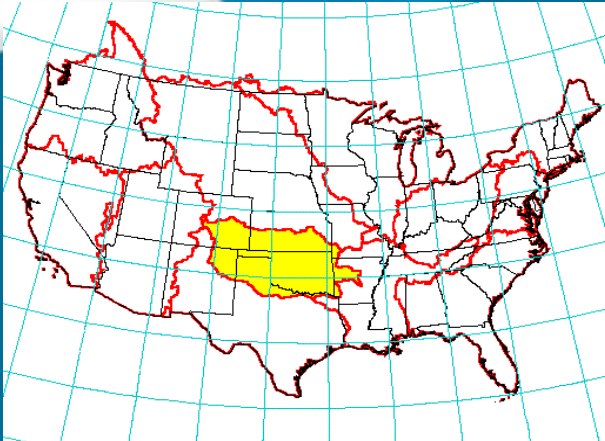
## With Partnered Data

- Inundation Forecasts

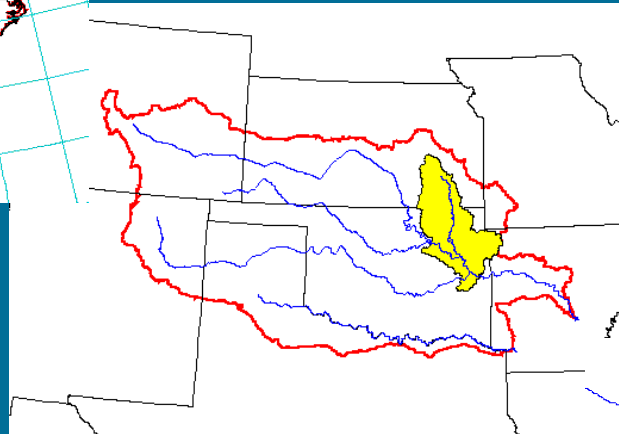




# Field Implementation

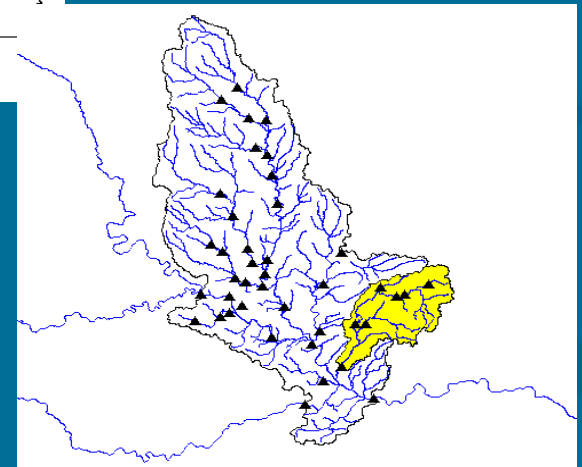


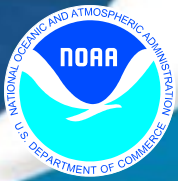
National



Major River Basin

Forecast Locations





# Calibration Data Preparation

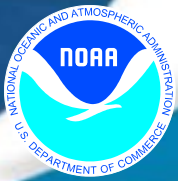
## Gather Information and Quality Control Historical Data

### Information

- Topography
- Vegetation
- Land use
- Lakes, glaciers
- River channel properties
- Dams, locks, levees
- Reservoir properties
- Soil properties
- Irrigation, drains
- River channel and valley shape
- River depth/flow relationships (rating curves)

### Data

- Rainfall
- Temperature
- River flow
- River height
- Evaporation
- Reservoir inflow and outflow
- Tides

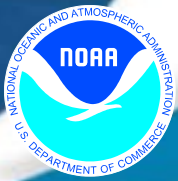


# NWS Soil Model Calibration



**For each river basin, tune model parameters**

- Specify initial parameters by analysis of historical river flows
- Cycle through parameters from slowest to fastest responding
  - deep aquifer flow
  - shallow aquifer flow
  - root zone flow
  - percolation
  - surface water fluxes (evaporation and plant transpiration)
  - surface flow
- At each level confirm improvement in model simulation and check that previously specified parameters are still valid
- Perform final water balance



# Science



## Basic

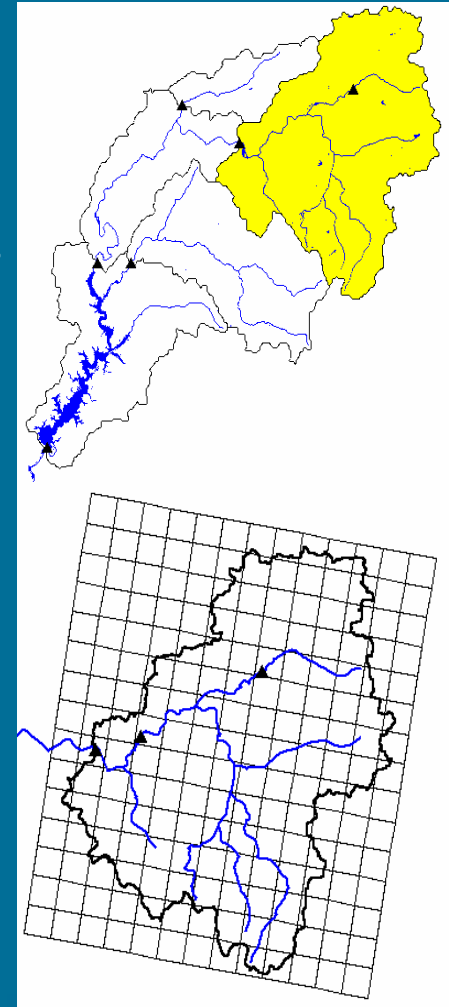
- Probabilistic Ensemble QPE
- Calibration System Enhancements
- River Mechanics
  - Modeling/Calibration
  - Utilities

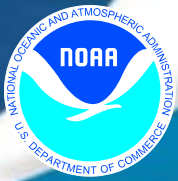
## Full

- Flash-Flood Modeling
- Distributed Modeling

## With Partnered Data

- Inundation Forecast Procedures





# Software



## Basic

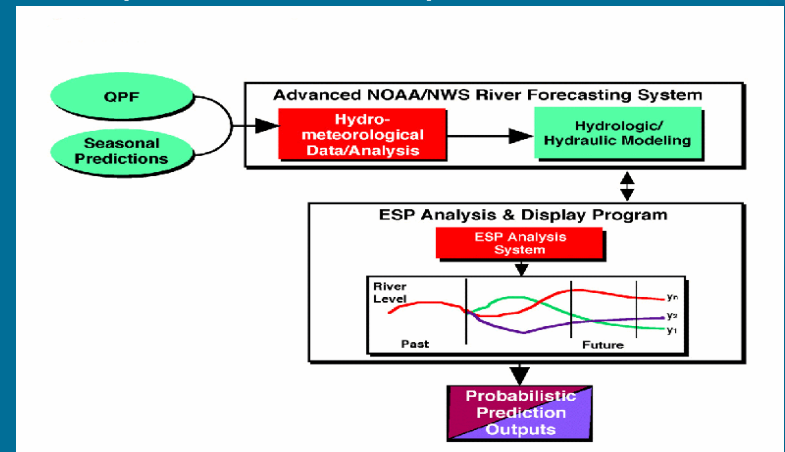
- Probabilistic Forecasting Verification
- Ensemble System Enhancements
- Reservoir and Diversions
- Software Support

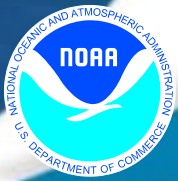
## Full

- Ensemble System Enhancement (short-term)
- Distributed Modeling

## With Partnered Data

- Inundation Forecasts

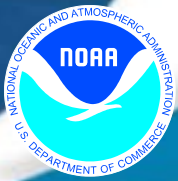




# Data



- Collection
- Quality Assurance
- Dissemination & Storage for
  - Calibration
  - Operations



# Advanced Hydrologic Prediction Service



## Presentation Outline

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# Multi-Year Budget Summary

## (\$K)

			PB Request					
	Prior Years	FY03	FY04	FY05	FY06	FY07	FY08-12	Total
<u>Acquisition</u>								
Implementation	1,540	2,680	3,900	3,900	3,900	3,900	15,260	35,080
<u>Recurring</u>								
Science Infusion	480	1,910	980	980	980	980	4,910	11,220
Software Enhancement	1,110	1,070	810	810	810	810	4,050	9,470
Data	80	220	270	270	270	270	1,350	2,730
Training/Outreach	28	140	140	140	140	140	800	1,528
Total Recurring	1,950	3,340	2,200	2,200	2,200	2,200	11,110	24,948
Total for FY	3,490	6,020	6,100	6,100	6,100	6,100	26,370	60,028
Cumulative								
Forecast Locations	351	717	1,228	1,731	2,234	2,721		4,011

# http://www.nws.noaa.gov/oh/ahps

National Weather Service - Advanced Hydrologic Prediction Service - Netscape

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Bookmarks Location: <http://www.nws.noaa.gov/oh/ahps/>



## National Weather Service Advanced Hydrologic Prediction Service

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[National Hydrologic  
Warning Council  
Benefits Report](#)

[Concept of Service](#)

[Implementation](#)

[Brochure](#)

[NOAA Magazine](#)



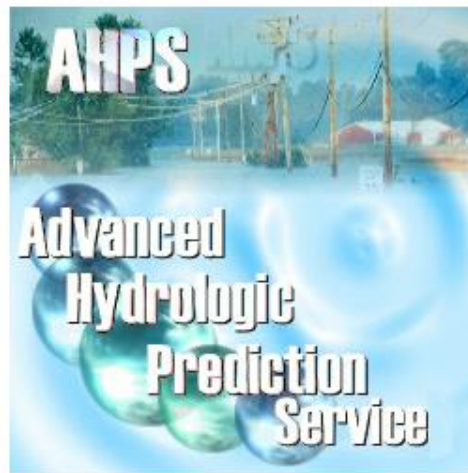
[National Safety  
Council Article](#)



### Presentation

[View](#)

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The Advanced Hydrologic Prediction Service (AHPS) provides new information and products provided through the infusion of new science and technology. This service improves flood warnings and water resource forecasts to meet diverse and changing customer needs. Additional information on the AHP Service program may be obtained by writing [AHPS@noaa.gov](mailto:AHPS@noaa.gov)

[>>> AHPS SETA ACQUISITION \(Click Here\)](#)

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